

# Notice of Allowability

Application No.

10/604,961

Examiner

Mark Ruthkosky

Applicant(s)

STEINBERG, MEYER

Art Unit

1745

## -- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☐ This communication is responsive to 8/9/2006.
2. ☒ The allowed claim(s) is/are 1-9.
3. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
  - a) ☐ All b) ☐ Some\* c) ☐ None of the:
    1. ☐ Certified copies of the priority documents have been received.
    2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
    3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

\* Certified copies not received: \_\_\_\_\_.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.

**THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.**

4. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
  5. ☐ CORRECTED DRAWINGS ( as "replacement sheets") must be submitted.
    - (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review ( PTO-948) attached
      - 1) ☐ hereto or 2) ☐ to Paper No./Mail Date \_\_\_\_\_.
    - (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date \_\_\_\_\_.
- Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
6. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

### Attachment(s)

1. ☐ Notice of References Cited (PTO-892)
2. ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3. ☐ Information Disclosure Statements (PTO-1449 or PTO/SB/08), Paper No./Mail Date \_\_\_\_\_
4. ☐ Examiner's Comment Regarding Requirement for Deposit of Biological Material
5. ☐ Notice of Informal Patent Application (PTO-152)
6. ☐ Interview Summary (PTO-413), Paper No./Mail Date \_\_\_\_\_
7. ☐ Examiner's Amendment/Comment
8. ☒ Examiner's Statement of Reasons for Allowance
9. ☐ Other \_\_\_\_\_.

**DETAILED ACTION*****Examiner's Amendment***

In response to applicant's request of 8/9/2006 that the claims be restored to their previous form in which they were allowed, an examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it **MUST** be submitted no later than the payment of the issue fee. The claims have been amended to remove the term "for" which indicates intended use of the steps of the method. By removing the word "for", the steps are positively recited in the claim. The application has been amended as follows:

In claim 1, line 2, after the word "steps" delete the word "for."

In claim 2, line 4, after the word "step" delete the word "for."

In claim 2, line 7, after the word "step" delete the word "for."

In claim 3, line 1, after the word "step" delete the word "for."

In claim 4, line 1, after the word "step" delete the word "for."

In claim 5, line 1, after the word "step" delete the word "for."

In claim 6, line 1, after the word "step" delete the word "for."

In claim 7, line 1, after the word "step" delete the word "for."

In claim 8, line 1, after the word "step" delete the word "for."

In claim 9, line 1, after the word "step" delete the word "for."

In the abstract, following the word "emissions" in the last line, add the sentence, "The method includes using an Electric Arc Hydrogen Plasma Black Reactor wherein hydrogen,

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carbon monoxide, carbon, ash and sulfur are produced and using a Direct Carbon Fuel Cell wherein a molten salt delivers the carbon produced from the reactor as a feedstock in the fuel cell to produce electricity and hot carbon dioxide gas.

***Allowable Subject Matter***

Claims 1-9 are allowed.

The following is an examiner's statement of reasons for allowance:

The instant claims are to a method for the production of energy, carbon, carbon monoxide and hydrogen from a carbonaceous fuel in a combined cycle, the method comprising

(a) a step using an electric arc hydrogen plasma black reactor wherein hydrogen, carbon monoxide, carbon, ash and sulfur are produced and used; and,

(b) a step using a direct carbon fuel cell wherein a molten salt delivers the carbon produced in step (a) as a feedstock and wherein electricity and hot carbon dioxide gas are produced and used.

The method further includes steps of using of the products of this method in further reactions to produce hydrogen and electricity, as described in the instant specification and specifically in the figures.

The prior art does not teach a method of using an electric arc hydrogen plasma black reactor to produce hydrogen, carbon monoxide, carbon, ash and sulfur followed by the step of using a direct carbon fuel cell wherein a molten salt delivers the carbon produced in step (a) to the direct carbon fuel cell producing hydrogen and electricity. Even if a method of using an electric arc hydrogen plasma black reactor to produce hydrogen, carbon monoxide, carbon, ash

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and sulfur is considered an obvious means for producing carbon, there is no motivation provided in the prior art to use a molten salt to deliver the carbon produced in step (a) to the direct carbon fuel cell.

The most pertinent prior art includes Cocks et al. (US 5,298,340), which teaches carbon-ion electrolytes in a carbon fuel cell. The carbon is directly added to a molten metal electrolyte. The process, however, does not teach the use of an electric arc hydrogen plasma black reactor to produce carbon followed by using a molten salt to deliver carbon as a feedstock to the fuel cell. In addition, Cooper et al. (US 2002/0106549) teaches a high temperature molten electrolyte fuel cell that directly converts ash-free carbon fuel to electrical energy. The method includes heating a carbon fuel cell to produce a molten electrolyte. The process, however, does not teach the use of an electric arc hydrogen plasma black reactor to produce carbon followed by using a molten salt to deliver carbon as a feedstock to the fuel cell. As the prior art does not teach or render the claimed method obvious, the claims of the invention are allowed.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

#### ***Examiner Correspondence***

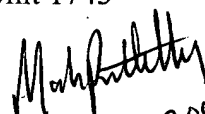
Any inquiry concerning this communication or earlier communications from the examiner should be directed to Mark Ruthkosky whose telephone number is 571-272-1291. The examiner can normally be reached on FLEX schedule (generally, Monday-Thursday from 9:00-

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6:30.) If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Patrick Ryan can be reached at 571-272-1292. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free.)

Mark Ruthkosky  
Primary Patent Examiner  
Art Unit 1745

  
8.19.2006